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EXAMINER

CAPUTO, LISA M

ART UNIT PAPER NUMBER

2876

DATE MAILED: 08/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/697,645

Applicant(s)

STROTHMANN ET AL.

Examiner

Lisa M Caputo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description:

Regarding Figure 3, reference numbers 332 and 340 are on Figure 3 but are not referenced in the specification. Regarding Figure 4, reference numbers 405 and 410 are on Figure 4 but are not referenced in the specification.

A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The disclosure is objected to because of the following informalities:

Regarding pages 8-10 of the specification: Reference numbers 120, 125, and 130 don't seem to correspond exactly to the reference numbers on Figure 1. In addition, reference number 130 is referring to two separate steps found on page 8, lines 21-23 and page 9 line 22 to page 10 line 1.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 27-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim independent 27, the metes and bounds of the claimed steps of receiving a candidate itinerary, determining a probability that the candidate itinerary is available, and outputting the probability, all within the computer readable medium are unclear. For example, a step of the method of claim 27 comprises receiving a candidate itinerary, however, there are no limitations regarding where the itinerary is received from and what the candidate itinerary details. In addition, there is no explanation on how the probability is calculated, and how or where the probability is outputted.

Regarding claim independent 34, the metes and bounds of the claimed steps of receiving a candidate itinerary including availability information and determining whether the availability information should be updated based on the candidate itinerary and a situation table, all within the computer readable medium are unclear. For example, a step of the method of claim 34 comprises receiving a candidate itinerary including availability information, however, there are no limitations regarding where the itinerary is received from and what the candidate itinerary details. In addition, there is no explanation on how to determine whether the availability information should be updated based on the candidate itinerary and a situation table.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 1-39, as best understood by the examiner, are rejected under 35 U.S.C. 102(e) as being anticipated by DeMarcken et al. (U.S. Patent No. 6,418,413, from hereinafter “DeMarcken”).

DeMarcken teaches a method and apparatus for providing availability of airline seats having all of the elements and means as recited in claims 1-39 of the instant application.

Regarding claims 1, 14, and 27, DeMarcken teaches a computer implemented method (i.e. computer program product, method, and system) for predicting travel resource availability that comprises the steps of receiving a candidate itinerary (the scheduler process 16 produces a set of flights from a travel request (as recited in claims 2, 15, and 28 of the instant application)) and determining and outputting a probability

that the candidate itinerary will remain available for booking a period of time (the look-up and retrieval process 94 can return a probability estimate of availability of a seat conforming to the parameters of the query; also, the threshold level predictor 140 can be used by the look-up and retrieval process 94 to determine if a stored query is stale) (see Figures 1-8, col 3, line 40 to col 8 line 26, especially col 3, lines 40-60 and col 7 line 52 to col 8 line 26).

Regarding claims 3-7, 16-20, and 29-33, DeMarcken teaches that the step of determining a probability comprises the step of calculating the probability based upon historical availability information (this table 150 could be populated by historical information about how often booking codes were available in the past for the airline/booking-code/days-before-departure). In addition, DeMarcken teaches the use of other parameters such as fare rules, lower-priced itineraries, flight departure dates, and unavailable itinerary to available itinerary status change in order to determine an itinerary and its probability (see Figure 8, col 7-9, especially col 8, lines 43-65 and col 9, lines 27-40).

Regarding claims 8, 21, and 34, DeMarcken teaches a computer implemented method (i.e. computer program product, method, and system) for increasing reliability of booking airline travel itineraries comprising the steps of obtaining a candidate itinerary including availability information (the scheduler process 16 produces a set of flights from a travel request) and determining whether the availability information should be updated based on the candidate itinerary and a situation table (wherein the situation table is created with sample itineraries and historical availability information as recited in claims

9-10, 22-23, and 35-36 of the instant application) (the threshold predictor 140 could be a table similar to FIG. 8 that includes for every airline/booking-code/days-before-departure entry, a number of hours after which a database answer will be considered stale. This table could be trained on historical data by recording for each airline/booking-code/days-before-departure combination the average maximum number of hours prior to a query that other queries returned the same answer. For example, if in the past on American 3 days before departure in booking code Q, query answers remained the same for an average of 8 hours, then 8 hours would be stored in the table, and database queries for AA/Q/3-days-before-departure would be considered stale if they were more than 8 hours old) (see Figures 1-8, col 3 line 41 to col 8 line 16).

Regarding claims 11-13, 24-26, and 37-39, DeMarcken teaches the use of different data sources to obtain availability information, determining the difference between the availability of the information and storing in the situation table an indication (based on the difference, if the difference exceeds an error threshold) that the availability information should be updated prior to booking. In addition DeMarcken teaches that the availability information is not updated when the candidate itinerary is rendered irrelevant by fare rules. DeMarcken discloses that referring now to FIG. 9, a model-based predictor embodiment 65c of the availability predictor 65 is shown. The model-based availability predictor 65c receives 122 a query from a user. The query 163, as shown in FIG. 9A, includes information including an airline 163a, a flight number 163b, a date 163c, an origin and destination (or city pair) 163d, as well as, one or more booking codes 163e. In addition, the query 163 may include other information including

point of sale, sales agent, possibly multiple flight numbers, possibly a trip origin and trip destination (as opposed to just the origin/destination of the flights being queried). The query 163 is parsed and analyzed 164 by the model-based availability predictor 65c to find features or characteristics of the query 163. That is, the query 163 is broken down to features such as flight number type, period of flight, origin and destination types, the length of time before the flight departs, travel times in the query, and so forth. In addition, the aircraft and capacity, as well as, external events such as sales and strikes, historical availability, and traffic on other flights properties of the traveler and so forth.

Referring now to FIG. 10A, one embodiment 65c' of the model-based availability predictor 65c is shown. The predictor 65c' determines 172 positive features of the query. The predictor 65c' retrieves 174 weights for the positive features with the weights either set in accordance with expert understanding of airline's availability, or, automatically from historical data. In this case, algorithms for setting the weights can be found in various statistics and "machine learning" textbooks such as "Neural Networks for Pattern Recognition" by Christopher Bishop, Oxford Press. One such algorithm is called "gradient descent" and is approximately as follows:

1. For each feature  $F$ , set its weight  $W(F)$  to 1.
2. Calculate for each feature  $F$  the number of historical queries that returned "available" that the feature occurred in, and call it  $H(F)$ . (For example, if an American Airlines feature (AA) occurred in 200 queries that were available, then let  $H(AA)=200$ ).
3. Using the current weights, calculate for each historical query  $H$  the probability  $P(H)$  of it being



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available, using the same equations used for normally predicting availability:

$P(H) = \exp(X) / (1 + \exp(X))$  where  $X = \sum W(F)$  for all features  $F$  in  $H$ .

4. For each feature  $F$ , calculate the number of times the current model predicts it will occur in available queries,  $M(F)$ , by summing  $P(H)$  over each historical query  $H$  that includes the feature  $F$ .

5. Calculate for each feature  $F$  the difference between the known number of times the feature appeared in historical queries,  $H(F)$ , and the predicted number,  $M(F)$ , and if for each feature the difference is less than a threshold, stop training and use the current weights.

6. Otherwise, update each feature  $F$ 's weight  $W(F)$  using the formula

$W(F) \leftarrow W(F) + K * (H(F) - M(F))$  where  $K$  is some small constant like 0.01.

7. Go to 3 until all weights have been determined (see Figures 7-11, col 7, line 52 to col 11 line 40, especially col 9-10).

### **Conclusion**

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Lisa M. Caputo** whose telephone number is **(703) 308-8505**. The examiner can normally be reached between the hours of 8:30AM to 5:00PM Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on 703-305-3503. The fax phone number for this Group is (703)308-7722, (703)308-7724, or (703)308-7382.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [[lisa.caputo@uspto.gov](mailto:lisa.caputo@uspto.gov)].

*All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record*

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*includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.*

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

LMC

July 21, 2003



**DIANE I. LEE**  
**PRIMARY EXAMINER**